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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,987	10/19/2001	Yuuzo Kamiguchi	215231US2RD	7487

22850 7590 11/26/2003

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ALEXANDRIA, VA 22314

EXAMINER
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BLOUIN, MARK S

ART UNIT	PAPER NUMBER
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2653

10

DATE MAILED: 11/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/981,987

**Applicant(s)**

KAMIGUCHI ET AL.

**Examiner**

Mark Blouin

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 5,7,9-13 and 15-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6,8,14 and 19-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All   b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 and 6.                      6) ☐ Other: \_\_\_\_\_

**Detailed Action**

***Response to Amendment***

- The reply filed on October 9, was applied to the following effect: Applicant's election with traverse of Species O and Claims 1-4, 6, 8, 14, and 19-21 in Paper No. 9 is acknowledged. The traversal is on the ground(s) that searching eighteen different species does not present a serious burden to the Examiner. This is not found persuasive because searching several subclasses is required for each species and that reviewing potentially hundreds of patents for eighteen different species presents a serious time burden. Furthermore, the election of species is based on the premise that the species are patentably distinct, and Applicant has not indicated otherwise. The requirement is still deemed proper and is therefore made FINAL.
- Claims 5,7,9-13, and 14-18 withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 9.
- Claim 21 is newly added.

***Information Disclosure Statement***

1. The information disclosure statement filed on November 17, 2003 has been considered by the examiner, however, the references have been lined through to prevent them from being printed on any patent that might result from this application.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 6 recites the limitation "...or on the **interface** of the non-magnetic intermediate layer." There is insufficient antecedent basis for this limitation.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1- 4, 6, 8, 14, 19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Kamiguchi et al (USPN 6,111,729).
6. Regarding Claims 1 and 2, Kamiguchi et al shows (Fig. 1) a magnetoresistance effect element (7) comprising a magnetoresistance effect film including a magnetization fixed layer (2) having a ferromagnetic film in which the direction of magnetization is substantially fixed to one direction, a magnetization free layer (1) having a ferromagnetic film in which the direction of magnetization varies in response to an external magnetic field, and an non-magnetic intermediate layer (3) provided between the magnetization fixed layer and the magnetization free layer, a pair of electrodes which are electrically connected to the magnetoresistance effect film for applying a current in a direction perpendicular to the plane of the magnetoresistance effect film (Col 12, lns 1-36), and a resistant regulating layer (5) which contains an oxide, a nitride, a fluoride, a carbide or a boride as a principal component (Col 5, lns 6-11) for restricting the quantity of a sense current passing through the magnetoresistance effect film.
7. Regarding Claim 3, Kamiguchi et al shows (Col 5, lns 21-37) the resistance regulating area has pin holes at a rate of hole area which is 50% or less.

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8. Regarding Claim 4, Kamiguchi et al shows (Col 5, lns 6-11 and Col 8, lns 20-28) a magnetoresistance effect element, wherein the resistance regulating layer is made of two kinds or more of metallic elements.

9. Regarding Claim 6, Kamiguchi et al shows (Fig. 1) a magnetoresistance effect element, wherein the resistance regulating layer is formed in the non-magnetic intermediate layer or on the interface ( The Examiner's interpretation of "interface" is the surface of the magnetoresistive element facing the recording medium) of the non-magnetic intermediate layer.

10. Regarding Claim 8, Kamiguchi et al shows (Fig. 1) a magnetoresistance effect element, wherein the resistance regulating layer contains, as a principal component, at least one of oxides, nitrides, fluorides, carbides or borides of an element selected from the group consisting of B, Si, Ge, Ta, W, Nb, Al, Mo, P, V, As, Sb, Zr, Ti, Zn, Pb, Th, Be, Cd, Sc, La, Y, Pr, Cr, Sn, Ga, Cu, In, Rh, Pd, Mg, Li, Ba, Ca, Sr, Mn, Fe, Co, Ni (Col 8, ln 28) and Rb.

11. Regarding Claim 14, Kamiguchi et al shows (Col 5, lns 3-5) a magnetoresistance effect element, wherein the resistance regulating layer has a thickness of 0.5 to 5 nm.

12. Regarding Claims 19-20, Kamiguchi et al shows (Claim 41) a magnetic recording and/or reproducing system which has a magnetic head, which is capable of reading magnetic information stored in a magnetic recording medium.

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiguchi et al (USPN 6,111,729) in view of Dieny et al (USPN 6,462,641).

15. Regarding Claim 1, Kamaguchi et al shows all the features described, *supra*, but does not show a magnetoresistive element, wherein the resistance regulating layer is formed in the non-magnetic intermediate layer, and contains a metal including at least one of Cu, Au, Ag, Ru, Ir, Re, Rh, Pt, Pd, Al and Os.

Dieny et al shows (Fig.1) a magnetoresistive element, wherein the resistance regulating layer (16) is formed in the non-magnetic intermediate layer (layers 24-16-26), and contains a metal including at least one of Cu (layers 24 and 26, Col 6, lns 10-18), Au, Ag, Ru, Ir, Re, Rh, Pt, Pd, Al (layer 16, Col 5, lns 61-64) and Os.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the MR element of Kamaguchi et al with the non-magnetic intermediate layer as taught by Dieny et al. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to provide the MR element of Kamaguchi et al with the non-magnetic intermediate layer as taught by Dieny et al in order to increase sensitivity, particularly for reading high density recording using very small quantities of magnetic flux.

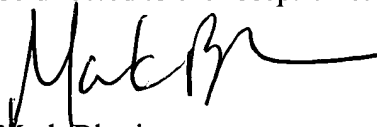
### ***Conclusion***

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Blouin whose telephone number is (703) 305-5629. The examiner can normally be reached M-F, 6:00 am – 3:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful the examiner's supervisor, William Korzuch can be reached at (703) 305-6137. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314 for regular and After Final communications.

Any inquiry of general nature or relating to the status of application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.



Mark Blouin  
Patent Examiner  
Art Unit 2653  
November 17, 2003



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